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Patterson Natural Area

Introduction

Eglin Air Force Base is the largest air force base in the free world, including 724 square miles of land area and about 130,000 square miles of controlled airspace overlying land and water. In this setting, Eglin conducts its primary mission of full-service air armament development through weapons system research, development, testing and evaluation; training; space operations; and base and range support. While fulfilling its mission, Eglin also manages its natural resources, acting as a steward to protect plants and animals for future generations.

The Patterson Natural Area, one of our nation's rarest vegetative communities can be found on the western portion of the base. This area is home to one of the few remaining old-growth longleaf pine stands. The Patterson Natural Area currently includes 928 acres, and Eglin plans to nearly quadruple its size by adding adjacent lands with old growth stands. Resource managers on the base, with the help of the Nature Conservancy and other independent conservation organizations, have studied these stands and many individual pines throughout the base. Scientists took core samples by boring into the trees and counted the extracted samples' rings. They were astounded to find that some pines were approaching 500 years old.

Long before the Europeans arrived, longleaf pines dominated the upland soils of the southeastern coastal plain, including the Florida Panhandle. The tree's dominance was linked to its ability to survive seasonal droughts, floods, and periodic fires. Throughout the southeastern coastal plain, many plants and animals evolved unique physical adaptations to coexist with the longleaf pine and to tolerate fires themselves. In recent history, however, much of what was once longleaf pine forest in the southeast United States has been cleared for farms, commerce, or urban development. And the regular pattern of natural fires — which controlled competing plants and trees — was disturbed by human interference. Along with the longleaf pine, a richly diverse community of native plants is now threatened or endangered.

At Eglin, however, the history of the longleaf pine is somewhat different. While fire has been occasionally suppressed, more often it has been used by people to suit their purposes. For example, Native Americans and early settlers set fires to clear land for cattle grazing. Even the later turpentine industry practiced some burning to keep down the understory and allow easy access to the trees for tapping. Today, Eglin resource managers regularly set controlled or "prescribed" fires. Occasionally fires resulting from the mission activities on base also occur and affect the Patterson area. Patterson, therefore, is a good example of a longleaf pine forest that has flourished because of prescribed and natural burning.

Patterson has an open overstory of old-growth and mature, second-growth longleaf pines that dominates a sparse understory of deciduous oaks. The groundcover is

a dense combination of wiregrass and other native grasses and fallen pine needles. These unique characteristics enable the Patterson Natural Area to provide suitable habitats for the more than 25 red-cockaded woodpecker cavity trees spread throughout the area. The red-cockaded woodpecker, listed as an endangered bird, prefers the openness of a mature, longleaf pine forest with low understory vegetation. Other animals specifically adapted to this fire-dependent habitat are the rare dusky gopher frog, the gopher tortoise, and the eastern indigo snake. These animals survive fast-moving fires by withdrawing into deep burrows until the fire has passed. Even many potentially endangered plant species, including the panhandle meadowbeauty, pineland hoary-pea, and the Karst pond yellow-eyed grass, have evolved to be not only fire tolerant but to flourish because of it.

Longleaf Pine Growth Cycle

The longleaf pine (*Pinus palustris*) has a remarkable growth cycle. Like other pines, almost two years are required for seeds to form in the pollinated cones. Unlike seeds of other pines, longleaf pine seeds germinate immediately when dispersed in the fall. During that winter and for several years following, the seedling devotes itself almost completely to growing a taproot deep into the sandy, often dry, soil. For three to six years the young pine looks more like a clump of grass than a tree and is able to survive hot, dry summers.

Natural Fires

In the longleaf pine community, summer is the season for natural fires, often ignited by lightning and fed by dry groundcover. These fast-moving, low-intensity fires usually do not kill the young seedlings. A ring of highly flammable needles surrounds the growing bud and, paradoxically, offers insulating protection. Botanists theorize that the steam in the flaming needles protects the bud in the same way that damp fingers can safely snuff out a candle flame. Not only will fire not kill longleaf pine seedlings but it often helps them survive. Some needles that are burned are infected with a common fungus that causes brownspot disease, a potential killer to the young pine. The needles can then grow back, fungus free, usually within six to 12 weeks.

The longleaf pine is the only American tree that can withstand controlled burning as a young tree, before the thick, fire-resistant bark of the more mature tree can develop. As the young tree matures, longleaf pines must undergo a period of rapid growth which raises the growing tip above the heat of a ground fire. This burst of growth is possible because of the store of nutrients collected in the taproot. During this time, however, seedlings less than 10 feet tall are susceptible to fire injury. The extent of injury depends on the heat of the fire. Fires fed by low ground cover are considered “cool” fires because they don't linger long enough to damage the fire tolerant pine. More destructive are “hot” fires that result when flammable shrubs and young deciduous trees are available as fuel. Hot fires often burn more slowly, destroying even the longleaf pine.

Prescribed Fires

Natural fires in the sandhills ecosystem are thought to occur in 3- to 5-year cycles. In an effort to reintroduce the benefits of fire to the Patterson longleaf community, resource managers at Eglin set prescribed fires which mimic the natural cycle. Certain areas are designated for burning in the existing natural area and the expansion area. The total area in 1995 was 60,000 acres spread throughout the entire base. The technology and experience exist today to maintain firm control over the fire's spread. The same equipment and techniques established by the National Wildfire Coordinating Group are used at Eglin to contain fires. Homeowners and their properties that border Eglin benefit from prescribed burning because fuel for more destructive and harder to control wild fires is kept from building up.

Prescribed burning typically takes place during the summer and early fall in an effort to expose the soil for the longleaf pine seeds. Burning eliminates competing hardwoods and opens the forest floor to more light. There in the mineral-rich ashes, the seeds have the right conditions to germinate.

The community of longleaf pine and associated plants and animals was once common throughout the southeast United States. Massive conversion of lands to agricultural, residential, and commercial development has reduced remaining original longleaf pine forests to isolated stands, like those at Eglin. Eglin understands the rarity of Patterson Natural Area and is taking steps to preserve it for generations to come.

This fact sheet is one in a series designed to inform the public about ecosystem and resource management activities at Eglin Air Force Base.
For more information, contact Environmental Public Affairs Coordinator, AFDTC/PAV, (904) 882-4436, Ext. 333.
This fact sheet is also available on the World Wide Web via the Eglin Homepage at http://www.eglin.af.mil

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